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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/560,268	04/26/2000	Whonchee Lee	150.0056 0102	2517

7590 03/09/2004

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EXAMINER	
DEO, DUY VU NGUYEN	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/560,268	LEE ET AL.	
	Examiner	Art Unit	
	DuyVu n Deo	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 January 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 64,65,67-76,89,90 and 92-95 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 68-76,89, 90, 92, 93 is/are allowed.

6)☒ Claim(s) 64,65,67,94 and 95 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 64, 65, 67, 94, 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano (US 6,110,839), Shiramizu (US 6,116,254), and Wei (US 4,350,564).

Nakano teaches a solution (claimed etching composition) comprising: HCl (claimed mineral acid), H2O2 (claimed peroxide), and water with their respective ratio of 1:1:10 (col. 6, line 39-44). Unlike claimed invention, Nakano is silent about using DI water; however, using DI or pure water to prepare similar chemical bath is well known to one skilled in the art as shown by Shiramizu (col. 1, line 32), and would have been obvious so that the chemical bath doesn't contain other contamination.

Unlike claimed invention, Nakano doesn't describe the HCl:H2O2:water concentration is at 1:1:25-1:1:15 respectively. However, chemical concentration is a result-effective variable as shown here by Wei (col. 4, line 34, 35). Therefore, it would have been obvious for one skill in the art to determine the chemical composition through test run in order to obtain optimum chemical concentration to provide a solution to remove metal impurities with a reasonable expectation of success. See also *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980).

Referring to claim 94, unlike claimed invention, Nakano doesn't describe HCl and H2O2 being used have a concentration of 37 wt% and 29 wt% respectively. However, he teaches HCl and H2O2 having concentration of 36 wt% and 30 wt% respectively. These concentration would essentially is the same as claimed concentration. It would have been obvious at the time of the invention for one skilled in the art that the final concentration being used would depend on the desired etch rate and material being etched; therefore, one skilled in the art would determine the chemical concentration through test run in order to obtain the optimum chemical concentration for the etching with a reasonable expectation of success. See also *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

3. Applicant's arguments, see the remarks, filed 1/22/04, with respect to claims 68-76, 89, 90, 92, and 93 have been fully considered and are persuasive. The rejection of these claims has been withdrawn. Applicant's argument that Nakano describes similar components in the solution but doesn't suggest or lead on skill in the art to modify the solution such that a specific etch rates for either cobalt and/or metal nitride at specific temperature is found persuasive.

4. Applicant's arguments to the rejection of claims 64, 65, 67, 94, 95 have been fully considered but they are not persuasive. The merely argument that determining the optimum ratio through routine experimentation is not appropriate in this case is found unpersuasive.

The motivation for doing the test runs, which any skill in the art would have to always perform before any actual process is carrying out, is to obtain optimum processing parameters including ratio, T for the remove the metal impurities.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. the solution capable of etching particular materials such as cobalt and metal nitride at particular advantageous rates or modifying the cleaning solution would become less reactive as opposed o having etching characteristics of etching cobalt and/or metal nitride,) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claims 64, 65, 67, 94, 95 do not claim etching any particular materials at any particular rates. They only claim a composition of compounds at certain ratio.

Allowable Subject Matter

5. Claims 68-76, 89, 90, 92, and 93 allowed because applicant's argument that Nakano describes similar components in the solution but doesn't suggest or lead on skill in the art to modify the solution such that a specific etch rates for either cobalt (greater than 1000 angstrom/min) and/or metal nitride (50-250 angstrom/min) at specific temperature (20-100 degrees Celsius) is found persuasive.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD
10/14/03